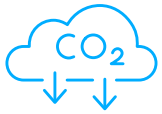
Creating a Winning Strategy for Smart & Autonomous Buildings

Brian Haines

Smart Building Level Set

Customer challenges for smart buildings



Decarbonization goals, building performance standards

Energy and carbon data collection and reporting is time-consuming. Evolving regulatory and certification standards make the task more troublesome.

Lack of resources and skills hinder savings

Identifying the correct course of action to save money and justify retrofits or repairs without the right skills and expertise is practically impossible.

Hybrid working and productive workplaces

Greater ratio of employees working onsite and remote; with expectation of a more healthy and collaborative work environment when they come in.

Dated buildings and equipment

Without reliable data and connectivity, it's harder to operate especially when such assets need more servicing and need lifecycle planning.

Lot of servicing needs with limited budgets

Aging service workforce and shrinking workforce

Stricter privacy regulations demand increased security

Several discreet technology platforms and systems

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The Evolution of Smart Buildings

LEGACY BUILDINGS

- Standalone systems

CONNECTED BUILDINGS

- Single dashboard
- Optimized for energy
- Two or more systems manually integrated

SMART BUILDINGS

- Intelligent and coordinated workflow
- Artificial Intelligence (AI) – emerging
- Most building systems integrated with discovery
- Cloud integrations (e.g. utility, weather)

AUTONOMOUS BUILDING

- Autonomous workflow
- Artificial Intelligence (AI+) – advanced
- Continuously learn, adapt and automatically respond to needs of the occupants and environment
- All systems – on site and cloud

Generative AI is Applicable to Smart and Autonomous Buildings

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Data is the foundation for the smart building

Leverage your building's data to meet sustainability goals, optimize safety and security, and enhance occupant health and productivity.

Bi-directional building data: *Ingestion via OT / IT universal gateways via OpenBlue Bridge*

Building Automation Systems
Metasys® | Verasys | EasyIO | Facility Explorer | Other BMS

Equipment
Chillers | AHUs | Terminal units | Elevators | Generators | + many more

Energy
Online | Offline | Virtual | Utilities

Sensors
IAQ | Occupancy | Lighting | Acoustic | Motion | Other

IT systems
ERP | Audio visual | Active directory | Office suite | Others

Cloud data: *Integrate with 30+ cloud APIs for data sources via OpenBlue Cloud*

CMMS (computerized maintenance management system)

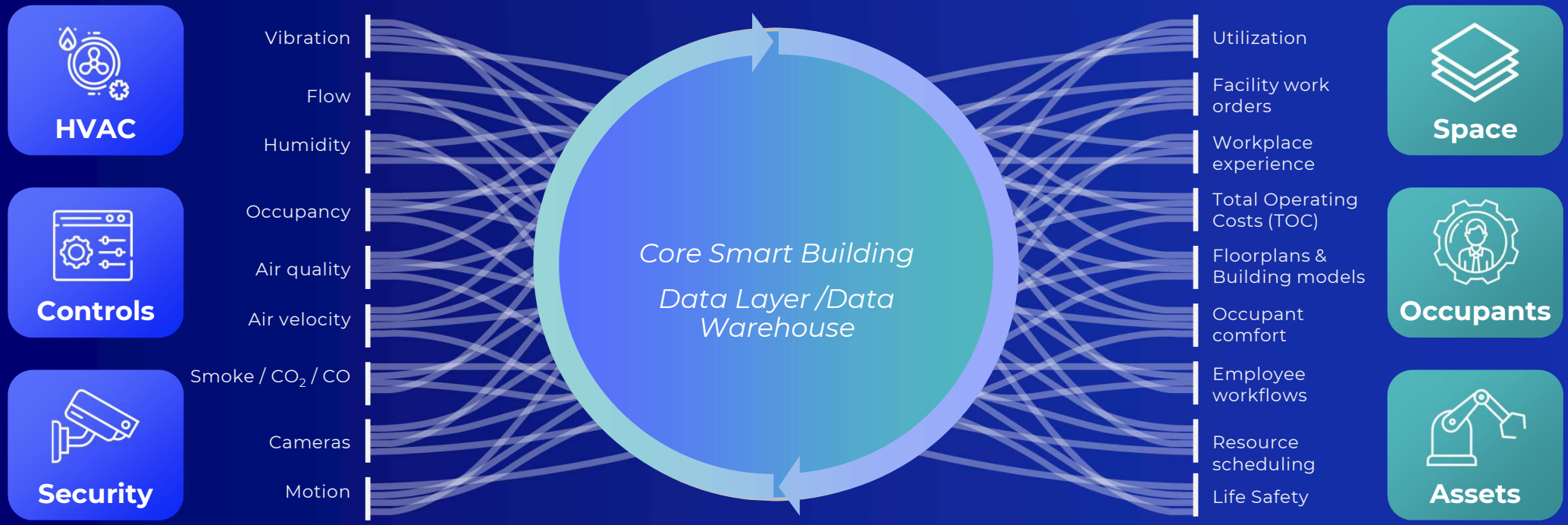
Utility integrations

IOT device API

Data lakes and warehouses; cloud IT systems

Weather, business data and other integrations

Closing the Digital Divide



The AI revolution for commercial buildings

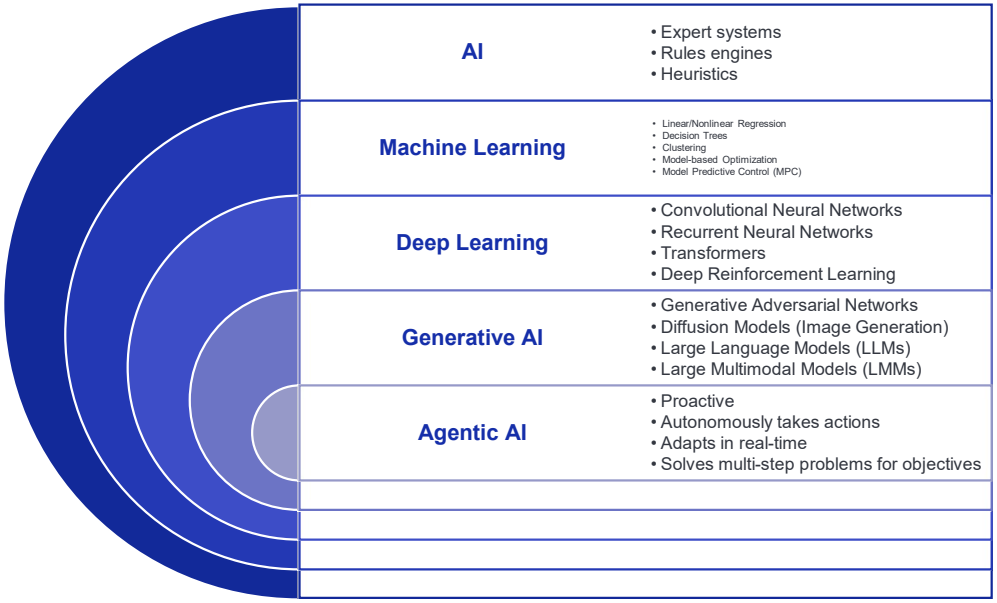
What is AI?

"The capability of a machine to imitate intelligent human behavior"

– Merriam-Webster

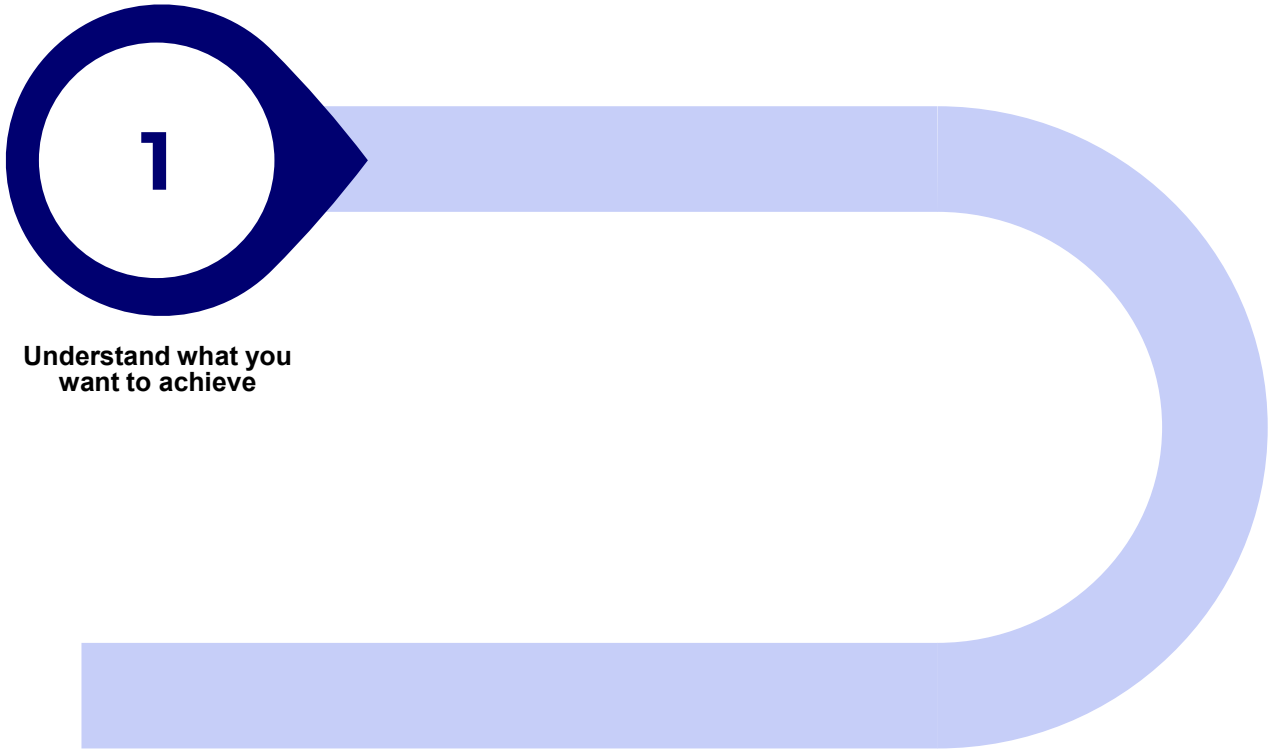
"AI technologies can perform tasks that typically require human intelligence, such as understanding natural language, recognizing patterns, making decisions and problem-solving"

– ChatGPT



The Smart Building Journey

The Smart Building Journey



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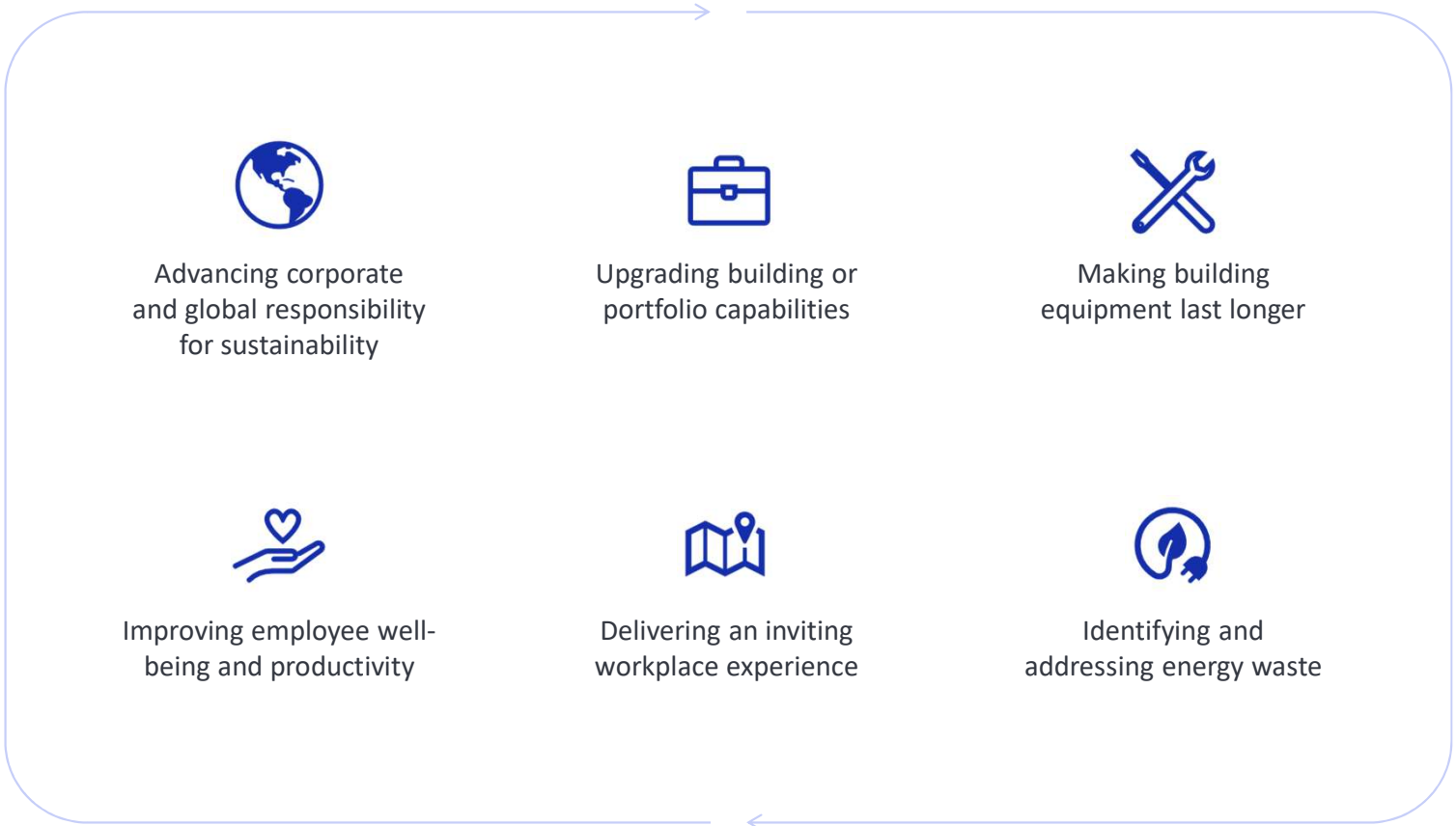
Benefits of Smart Buildings



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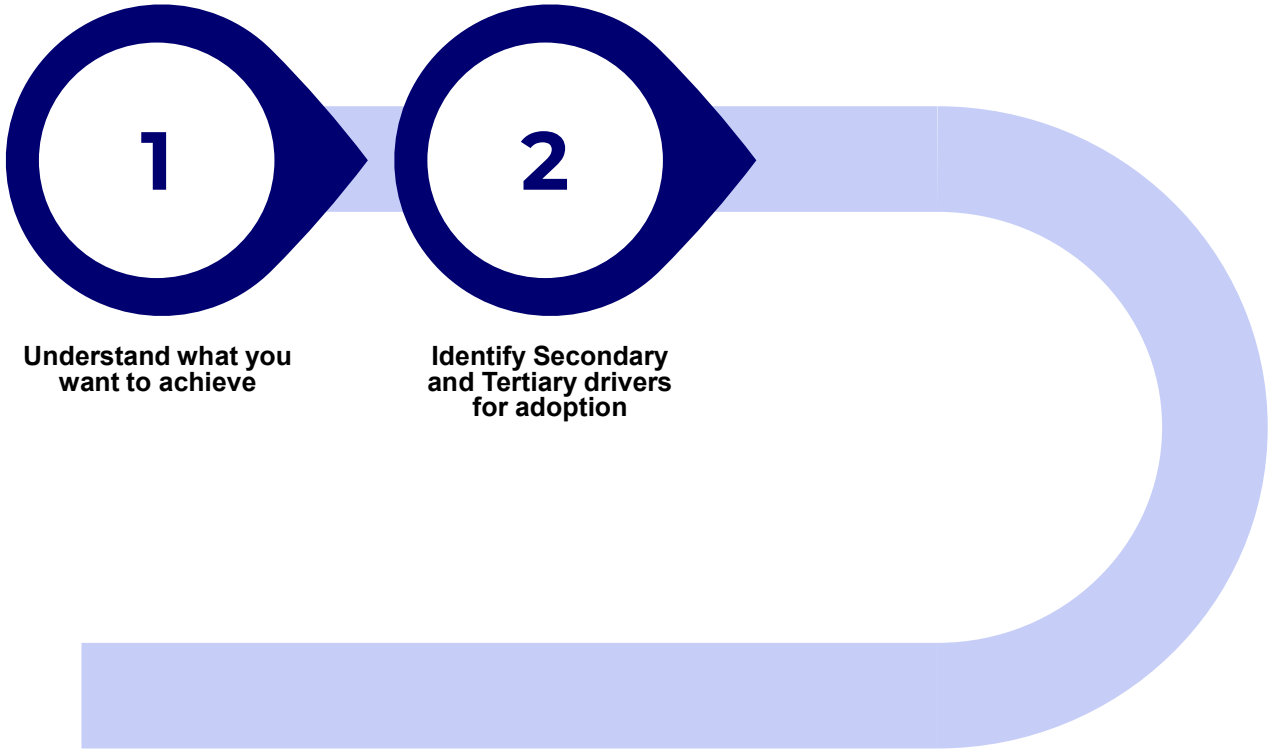
The Smart Building Journey



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Benefits of Smart Buildings

Inefficiency

Waste

Duplicated effort

Long hours

Confusing & inconvenient scheduling

Difficulty in accessing the information they need to do their job

Inadequate communication

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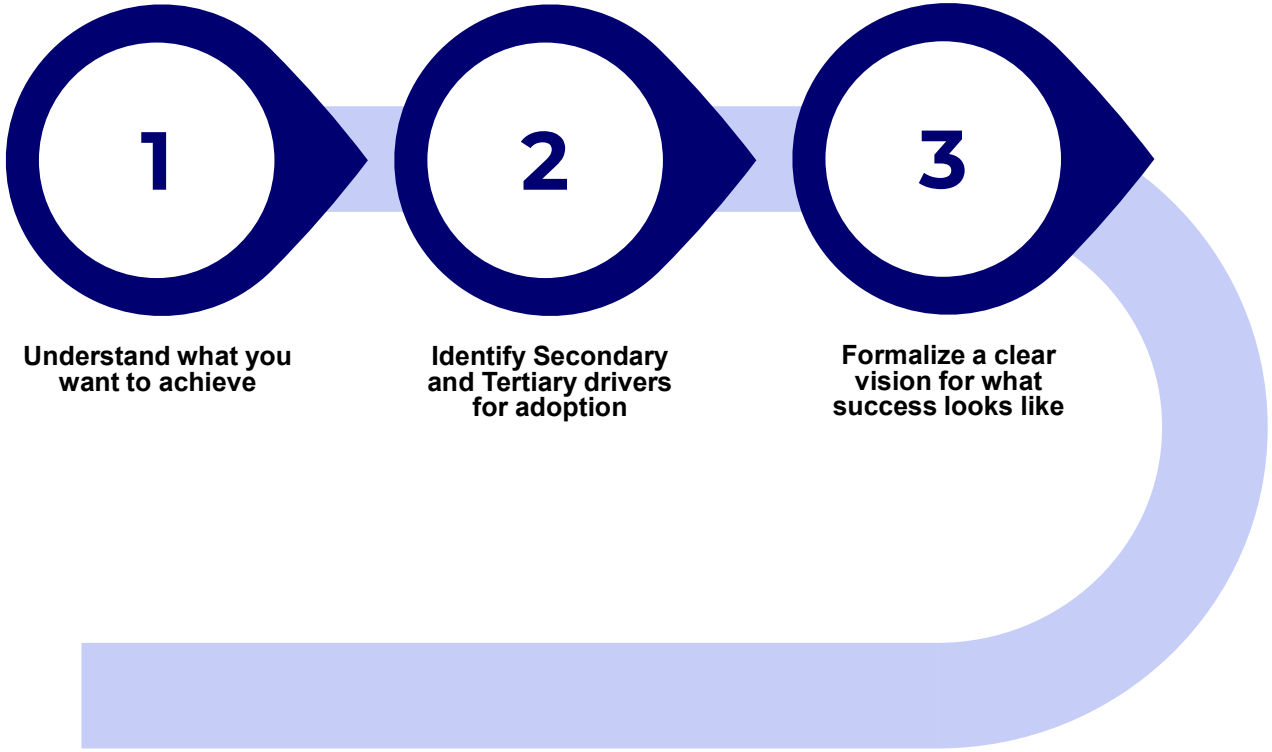

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Energy Efficiency & Sustainability: Where do I start?

It often begins with ensuring you have the necessary data to begin the journey

Gather and Audit Data

Do we have the necessary data to begin to assess our physical environment?

Baseline Your Operations

Measure the performance of your existing operations to establish a baseline

Benchmark Against Standards

If possible, can we measure our baseline against other “like” organizations in our region to see how we are doing at the start?

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CASE STUDY

International Airport, Atlanta

Goal: Automate manual defect tracking process and improve passenger comfort

Sustainability targets
Multiple GHG reduction commitments to limit global temperature rise to 1.5ºC. Reduce scope 1 and 2 by 95% by 2040.

Challenges and solution

Manual maintenance prioritization based on a running defect list

BMS alarms were reactively used to identify potential equipment failures

Comfort complaints from passengers and airline executives due to inconsistent terminal temperatures.

Disconnected systems (BMS, Elevators, Energy Meters, Trash Compactors, etc.) prevented holistic energy management.

Solution

Leveraged FDD to augment alarm data with equipment performance trends.

Created a structured maintenance prioritization system rather than relying solely on manual processes.

Connected disparate systems under a unified platform for better monitoring and control.

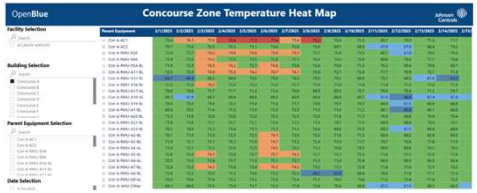
Implemented **automated comfort monitoring**, reducing reliance on passenger complaints.

Results

95% automated identification of manual Defect List reducing team effort by 5-10 hours per week

Lowered operational costs through proactive maintenance rather than reactive repairs.

Reduced passenger complaints by dynamically adjusting terminal temperatures.

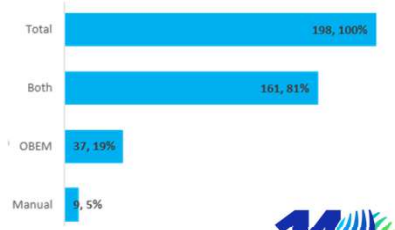


Lessons learned

✅ **Set clear goals**—airport set targeted objectives rather than broad "smart building" ambitions.

✅ **Identify champions** within operations and maintenance teams to drive adoption.

✅ **Stage pilots and iterate** — small win justified broader investments in smart technology.



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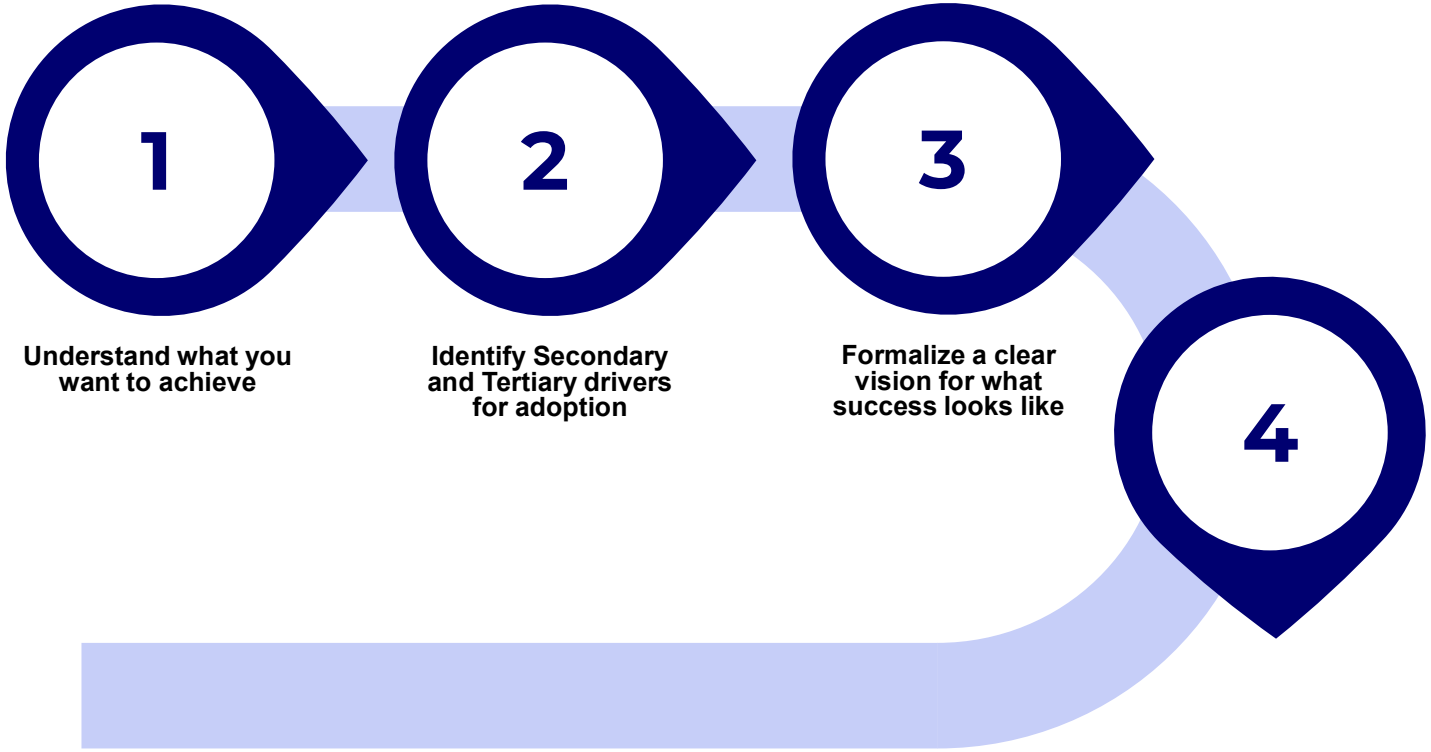
The Smart Building Journey



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Asking Questions and Getting Help

- What level of scalability do I need?
- Is the system proprietary or based on open standards?
- How are these systems secured?
- What kind of customer support does the provider offer?
- What kind of training does the provider offer?
- How difficult will it be to upgrade and maintain these systems over time?
- What the financial condition and outlook for a potential partner?
- What existing solutions do you have in place that might guide your decision-making?

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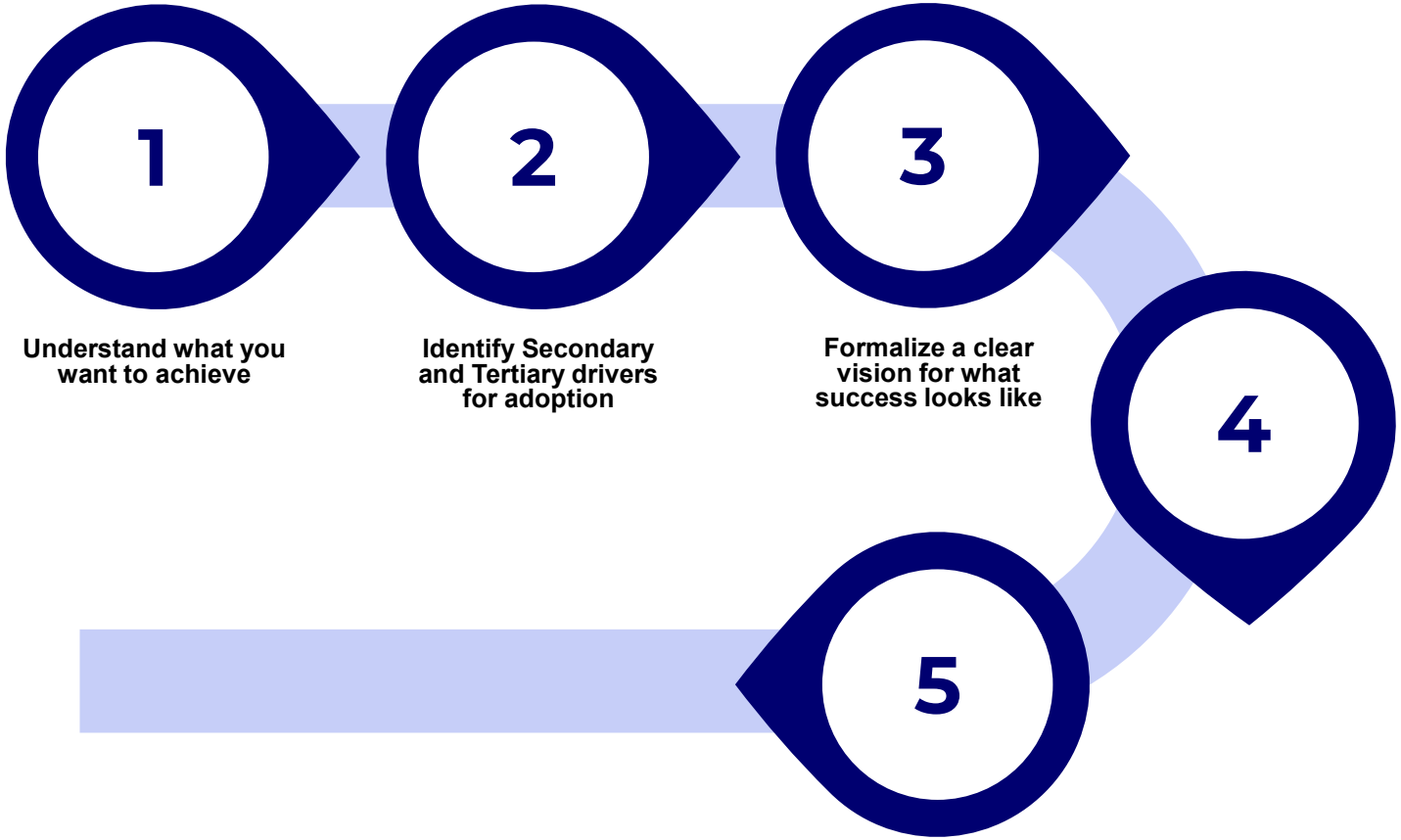

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Preparing for Deployment

- Are there infrastructure challenges in your deployment?
- Have you included your IT colleagues in your plans?
- Are there institutional/ HR policies in place that need to be considered?

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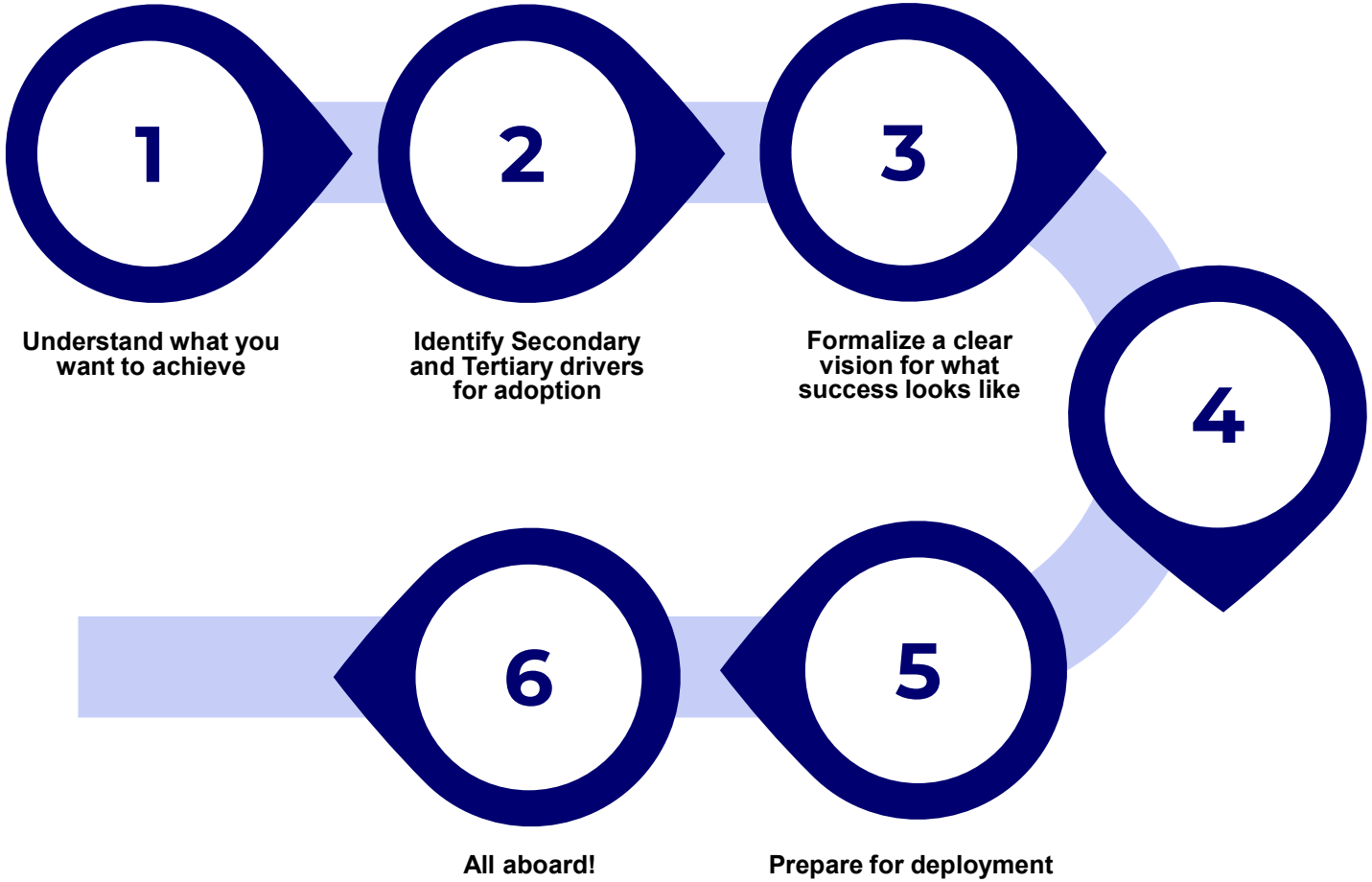

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All Aboard! - Benefits of Smart Buildings

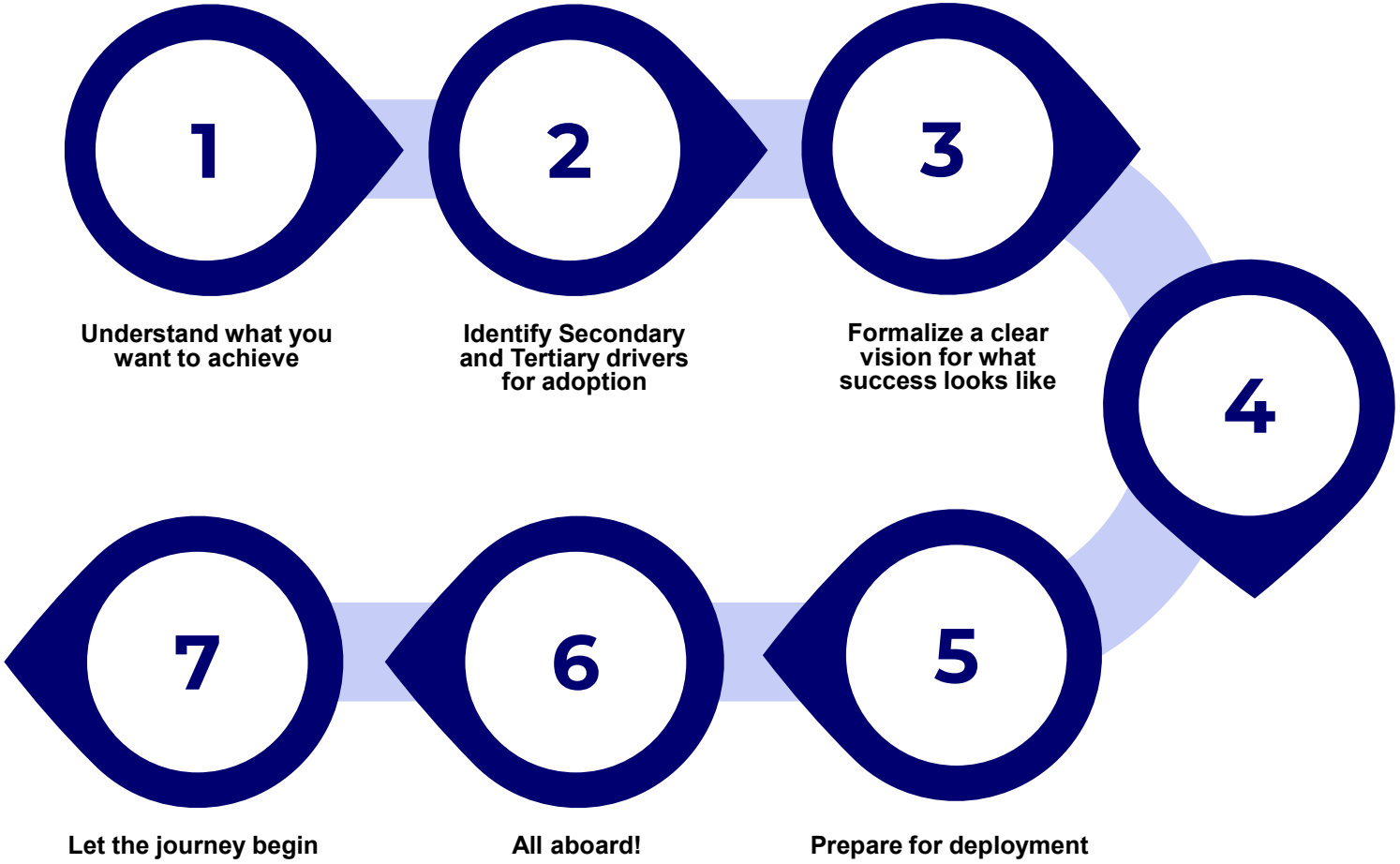
What's happening
(in detail)

How the change will benefit them
(on company, team and individual levels)

How and when the change is being implemented

How the change will disrupt their normal workflow, and for how long

The Smart Building Journey



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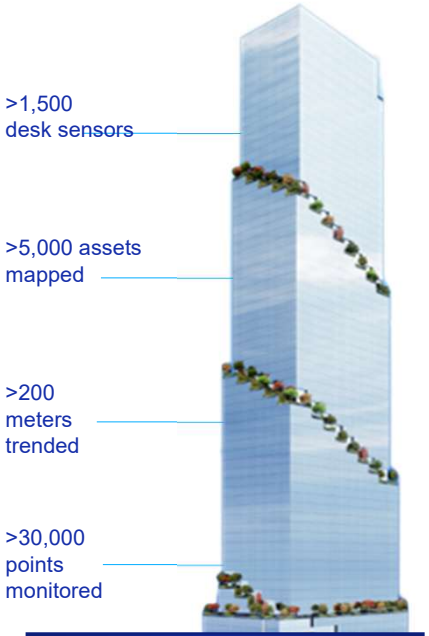
CASE STUDY

HQ office for life sciences company, New York City

Goal: Achieving energy savings, high indoor air quality and sustainability certifications to deliver a world-class global smart building



Sustainability targets
Multiple GHG reduction commitments to limit global temperature rise to 1.5ºC. Reduce scope 1 and 2 by 95% by 2040.

Challenges and solution

Goal: Create a healthier and more sustainable workplace

1. Best **people experience and wellness**
2. Optimize **facility utilization**
3. **Carbon management**: Meet ambitious corporate sustainability/GHG goals

A suite of AI-enabled cloud applications were implemented on 15 floors of a 66-story skyscraper. Integrated data from BMS, HVAC, PDU and submeters provided real-time visibility of assets, people and processes within this HQ office. GenAI energy recommendations and 48-hour energy predictions enabled the delivery of goals.

Results

Achieved **LEED Platinum**, **WELL Platinum** certifications.

Maintained high indoor air quality and occupant satisfaction.

Identified potential savings of **123 metric tons CO_2e/yr.**

Achieved **15% energy savings** over baseline through:

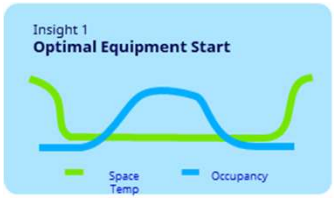
- Lighting power reduction
- Optimized temperature setpoints and equipment schedules
- High-efficiency mechanical equipment
- Optimized ventilation

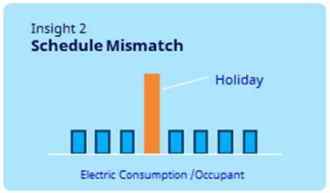
Lessons learned

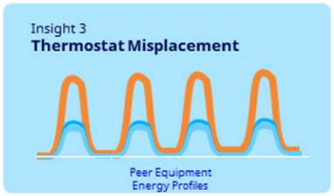
✅ **Choose the right solution for your journey**—even for advanced teams, selecting a platform that aligns with specific building goals and operational needs is critical.

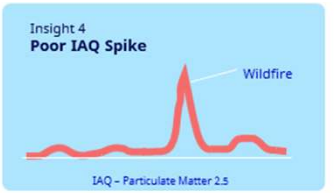
✅ **Identify your end users**—Ensure the solution delivers insights that each stakeholder can act on. Ongoing training was critical.

✅ **Stage pilots and iterate**—testing in occupancy IoT before scaling to Energy & Occ allowed for fine-tuning and ensured broader adoption.









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Best Practices for your Smart Building Journey

Success requires clear goals —avoid overcomplicating objectives.

Identify your end users and expertise —Ensure the solution will meet the intended users' needs.

Choose the Right Solution for your Journey— pick solutions based on your budget and support needed.

Know your buildings — assets, metering, age, control systems, availability of data, etc.

Stage pilots and iterate—Pilot smart building technologies and expand based on proof of value

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Thank You

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